MISSISSIPPI STATE UNIVERSITY

INVITATION FOR BIDS
OFFICE OF PROCUREMENT & CONTRACTS

1. INSTRUCTIONS FOR BIDDERS

a. Sealed bids will be received in the Office of Procurement & Contracts, Mississippi State University, for the purchase of the items listed herein.

b. All bids must be received in the Office of Procurement & Contracts on or before the bid opening time and date listed herein. Delivery of bids must be during normal working hours, 8:00 a.m. to 5:00 p.m. CST, except on weekends and holidays when no delivery is possible.

c. Bidders shall submit their bids either electronically or in a sealed envelope. To submit electronically, follow the instructions below. Bids CANNOT be emailed.
   i. Sealed bids should include the bid number on the face of the envelope as well as the bidders' name and address. Bids should be mailed to: 245 Barr Avenue, 610 McArthur Hall, Mississippi State, MS 39762.
   ii. At this time we only accept non-ITS bids electronically. For electronic submission of bids, go to: https://www.ms.gov/dfa/contract_bid_search and use the RFX number on the next page as your reference number.

d. All questions regarding this bid should be directed to the Office of Procurement & Contracts at 662-325-2550.

2. TERMS AND CONDITIONS

a. All bids should be bid "FOB Destination"

b. Bidders must comply with all rules, regulations, and statutes relating to purchasing in the State of Mississippi, in addition to the requirements on this form. General Bid Terms and Conditions can be found here: https://www.procurement.msstate.edu/procurement/bids/Bid_General_Terms_May_2019_V2.pdf

c. Any contract resulting from this Invitation for Bid shall be in substantial compliance with Mississippi State University's Standard Contract Addendum: https://www.procurement.msstate.edu/contracts/standardaddendum.pdf

Bid Number/RFX Number: 22-60/RFX#3160004980
Opening Date: April 6, 2022 @2:00 p.m.
Description: 5-Axis CNC Milling Machine

Vendor Name: _____

Vendor Address: _____

Telephone Number: _____

Days the Offer is Firm: _____

Authorized Signature: _____

Name: _____

Title: _____

Item	Quantity	Description	Unit Price	Total Price
1	1	5-axis CNC Milling Machine As per attached documents		

5 Axis CNC Machining Center Requirements

Revision: A
16 March 2022

Mississippi State University
Raspet Building 1
110 Airport Rd.
Starkville, MS 39759

Record of Change

REVISION	CHANGE	DATE	PAGE
None	Initial Release	1/15/22	
A	Revised and rewritten	3/16/22	All

Table of Contents

1.0 Scope

Mississippi State University (MSU) is expanding the capabilities of its Advanced Composites Institute (ACI) housed Building 1 of the Raspet Flight Research Laboratory at 110 Airport Road in Starkville, MS. In support of an expected increase in volume of composites fabrication work to be conducted at the lab, the ACI is requesting bids for a 5-axis computer numeric control (CNC) router. The application will be specific to non-metallic [thermoset 3D printed] mold fabrication and trimming / drill of carbon fiber and similar fabric composite components. Minimum requirements for the equipment and installation are summarized in this document and are not intended to limit the configuration capabilities or services offered by potential suppliers.

2.0 Facility

The photos and floorplan shown in Figures 1 – 4 provide an overview of the planned location for the machine. The blue Arboga mill currently shown in the photographs will be removed prior to the installation of a new machine. The 15 ft deep concrete pilings will remain in place, allowing them to serve as stabilization for a new foundation as required. Submittals should include foundation requirements and sufficient detail on load path from the equipment to support ACI's review of foundation modification needs. Headroom within the area is 16 ft. max with access by a pair of 11 ft. – 10 in. roll up doors. The room is air conditioned and typically held between 70°F - 75°F.

3.0 Equipment Requirements

The following section describes the general requirements for the size, tolerance, and capabilities of the machine. The information listed here should be regarded as minimum performance requirements; .

In general, the mill shall include:

- Simultaneous 5-axis motion control (X, Y, Z and 2 for spindle orientation)
- Variable spindle speed
- HSK-63F Spindle Taper, 17 HP minimum, liquid cooled spindle with chiller and selectable cooling provision of oil mist / air blast to tooling
- Max spindle speed - 20,000 rpm minimum
- Capable of spindle synchronization and control for rigid tapping capability
- A minimum work envelope of 144" (X) by 60" (Y) by 40" (Z)
- Minimum ±200 degrees of rotation about the spindle axis
- Minimum of ±100 degrees of spindle tilt axis movement
- Provisions for workholding built into table (T-slots, threaded holes, etc.)
- Automatic tool changer, 12 tool minimum
- Tool touch off probe for tool length offset measurement and compensations to be accurate withing +/-0.001"
- Wireless Renishaw Probe System with macros for tool length and work offset compensation and measurement verification
- Touch probe with riser block for measurement of tools
- Capable of volumetric compensation for 0.001" or better positioning accuracy
- Positioning repeatability error of 0.0005" maximum
- Spindle TIR – 0.0005" maximum

- Max Weight on Table: 4000lbs minimum
- Max Cutting Feed Rate 500 ipm minimum
- Max Rapid Feed Rate on X,Y,Z 750 ipm minimum
- Traveling spindle guard for chip / plumbing for dust collection system
- FANUC controller with handheld control pendant and Mastercam software
- WiFi and Ethernet Connectivity
- Wifi Camera optional
- 64 GB expanded program memory option if available
- 8 Spare M functions and cables for external device control if available
- Capable of running on 480V power
- Full machining zone enclosure with dust collection porting allowing for direct interface of an external dust collection system to protect operator and equipment in adjoining environment
- 2 year extended warranty and any available educational discounts to be applied as available
- Online analysis capabilities for current and historical performance of the machine system, including data supporting preventive maintenance inputs and ability for external notifications through text or email on user define critical parameters
- Include proper ventilation and motor/electrical protection in the machine for carbon fiber trimming and fiber infused thermoset plastics to protect from dust damage to equipment electrical and mechanical components.
- Training on both machine system operation and Mastercam software
- Factory provided set-up and commissioning of system at ACI
- Tooling support services prior to delivery, allowing tool selection / procurement to be performed by ACI as an assist for system commissioning and training

4.0 Contractor Requirements

The contractor shall design and build the 5 axis CNC machine defined in Section 3.0 or, as appropriate, be a factory authorized distributor with access to full factor support and factory trained installation / service personnel.

5.0 Deliverables

This section summarizes the products and/or services that are expected to be provided by any prospective company submitting a bid for this purchase. Please itemize quotes included in any bid submissions where possible. Deliverables for this purchase shall include:

- 5-axis machining center and any included accessories / tooling
- Assembly and installation at MSU facility
- Basic operators training and operators manuals
- Service manual including wiring schematic and recommended maintenance
- Spare parts recommendation list and preventive maintenance consultation

6.0 Schedule

Machine to be furnished as soon as possible after review of bid / proposal packages received and MSU's selection of machine supplier. Please include estimated lead time and schedule for fabrication, delivery, installation, and training after receipt of PO.

7.0 Figures

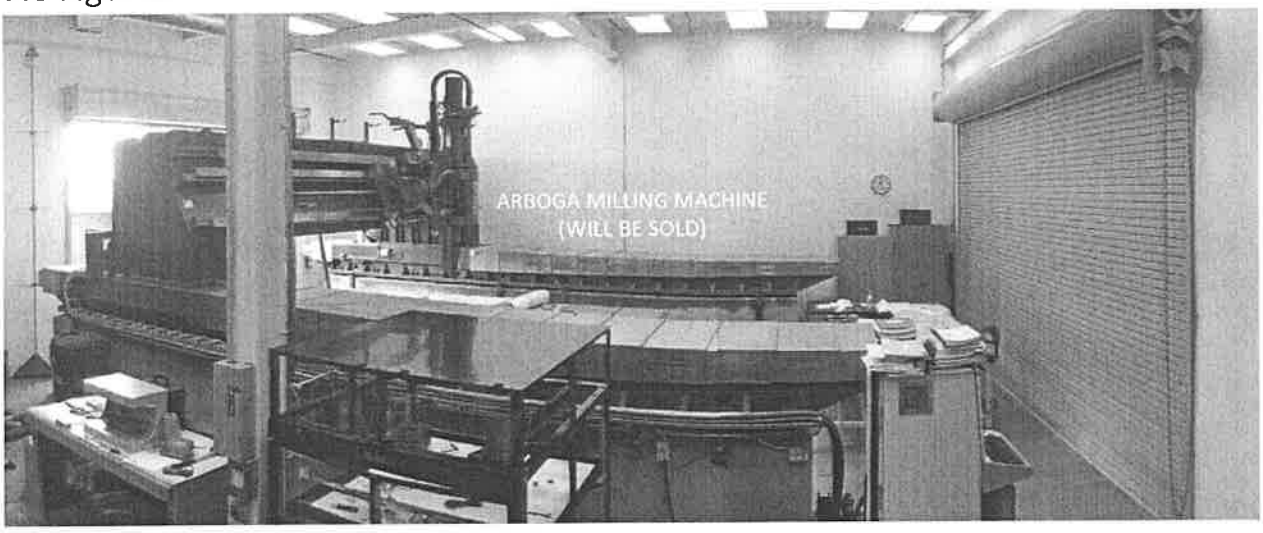

Figure 1. Photo of area to be available for CNC machine installation

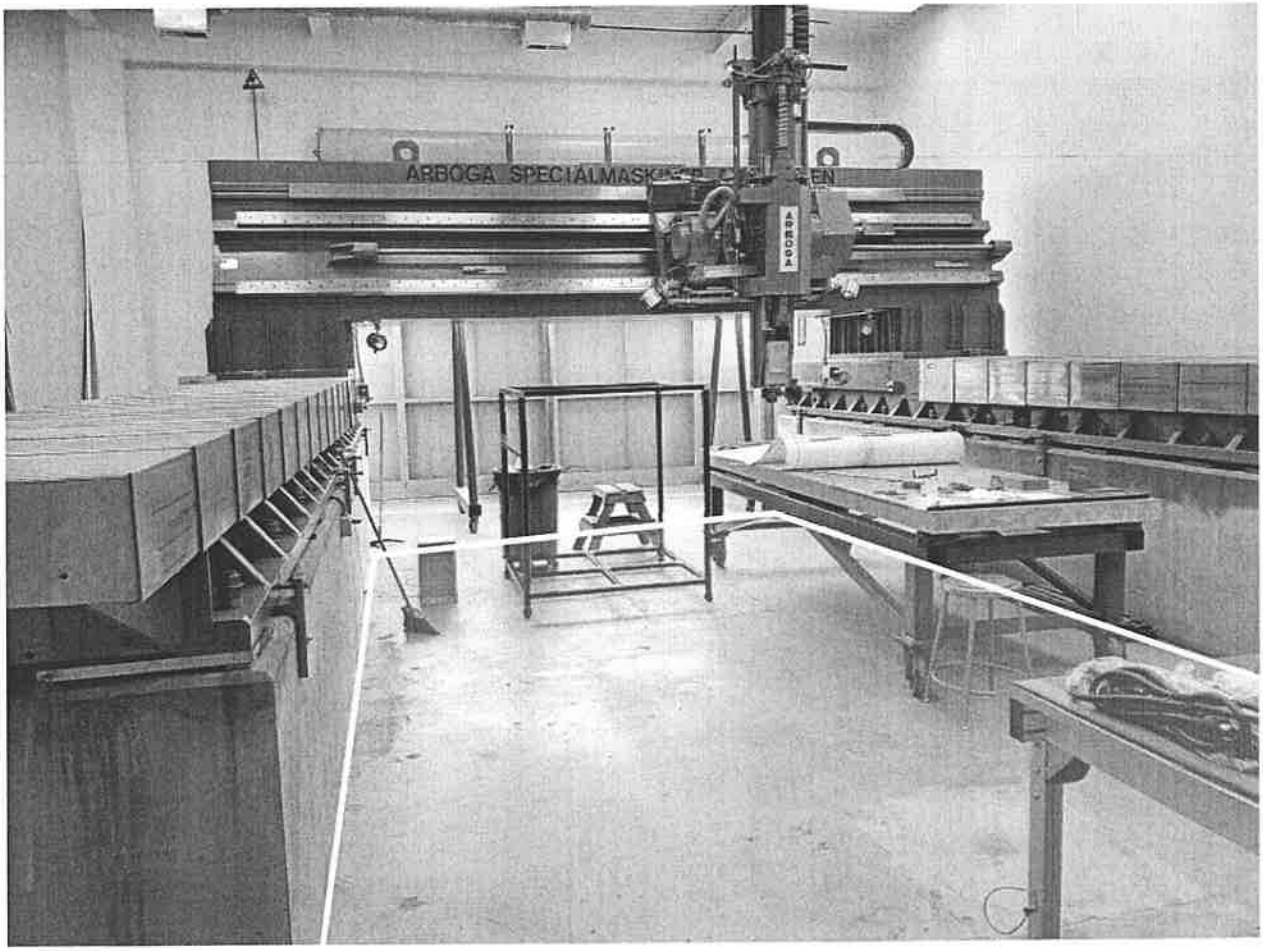

Figure 2. Alternate view of location of 5 axis CNC machine (Old machine removal in process)

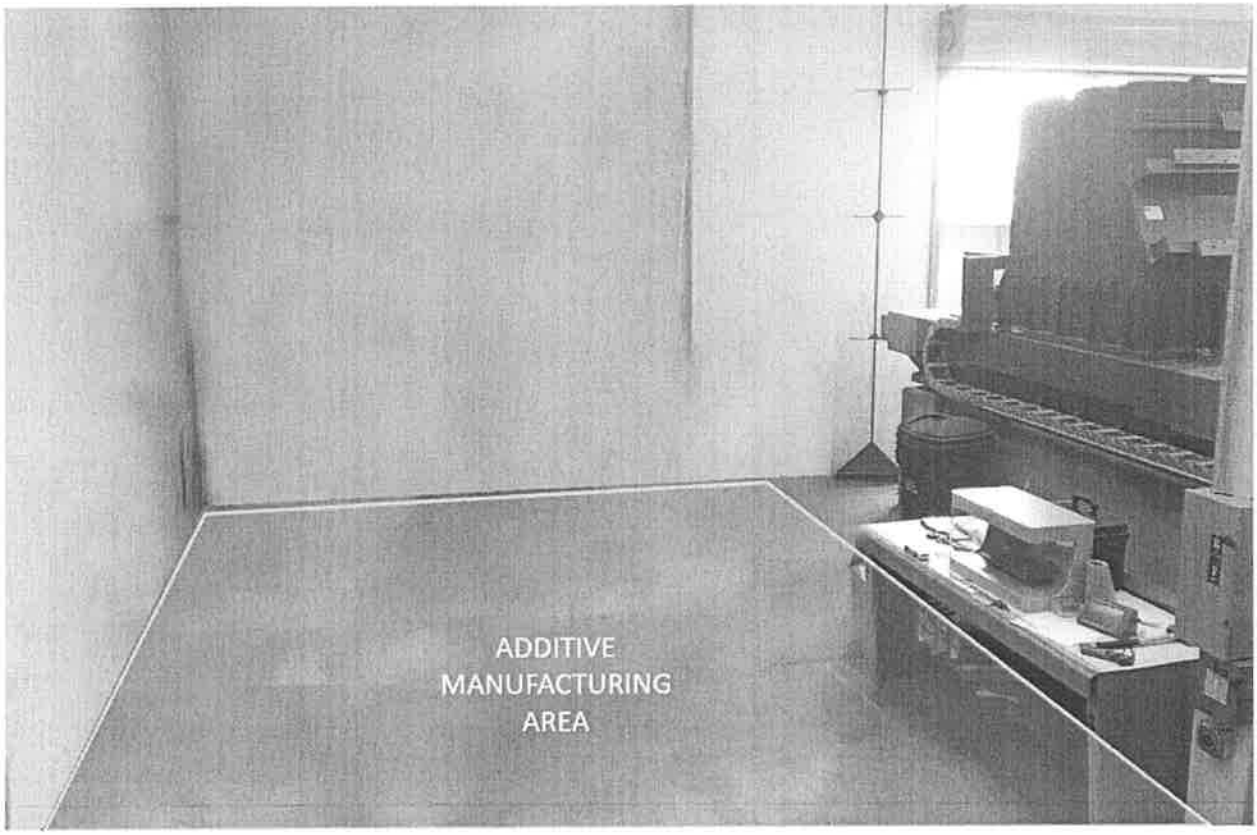

Figure 3. View of area reserved for large additive manufacturing machine

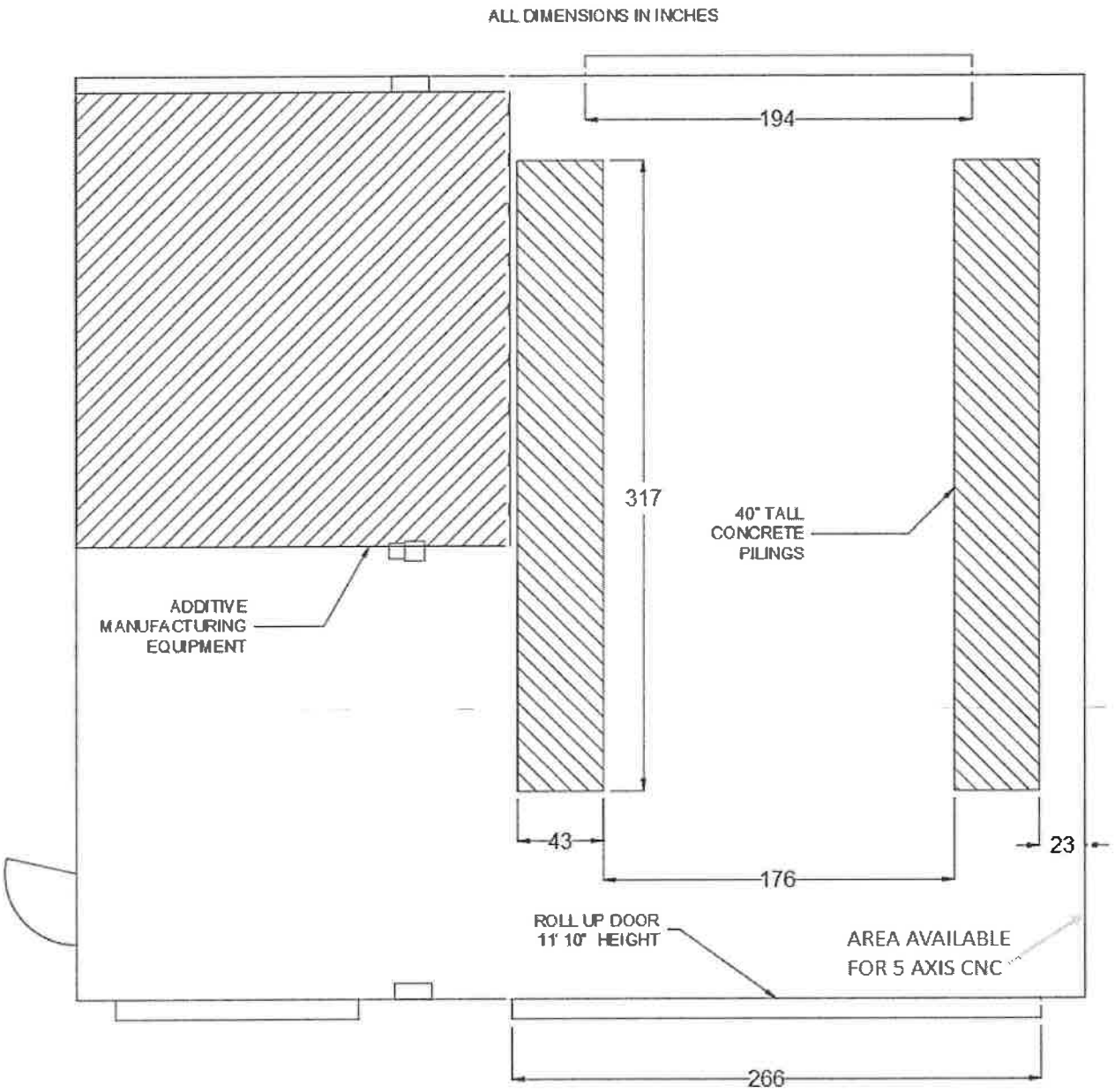

Figure 4. Sketch of floorplan depicting measurements of area available for 5 axis CNC machine